

Athripsodes species

There is a single female, apparently of this genus, from Deganya A, 19 April 1965, which I cannot determine to species.

Botosaneanu records the larvae of a leptocerid which may well be a species of *Athripsodes*, and Tjeder (1946b) mentions that he has females of two unidentified species of Leptoceridae.

REFERENCES CITED

- BARNARD, K. H. 1934. South African Caddisflies (Trichoptera). Trans. Roy. Soc. S. Afr. 21: 291-394.
- BOTOSANEANU, L. 1963. Trichoptères du lac Houle (Israel). Polsk. Pismo Ent. 33: 95-99.
- KIMMINS, D. E. 1957. Notes on the Psychomyidae (Trichoptera) from the African mainland (south of the Mediterranean region), with particular reference to the genera *Ecnomus* and *Psychomyiellodes*. Trans. Roy. Ent. Soc. Lond. 109: 259-273.
- TJEDER, B. 1946a. On a small collection of Trichoptera from Palestine. Ent. Tidsk. 67: 154-157.
- . 1946b. Trichoptera from the River Jordan, Palestine. Opusc. Ent. 11: 132-136.

**Macdonaldium fungi, a New Genus and Species
of the Feather-Winged and Smallest known
beetles (Coleoptera: Ptiliidae) from
East Como, Quebec**

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The ptiliids or the feather-winged beetles are the smallest of all the Coleoptera, ranging from 0.25 to 1 mm, and are poorly known, being currently studied by very few specialists. An interesting historical account of the North American ptiliids is given by Barber (1924) who opens his paper with the statement

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"Seventy years ago a Russian travelling in the United States collected a colony of microscopic beetles in a fungus in Georgia and no coleopterist appears to have found the species since" and goes on to revise the American Nanosellinae. No systematic study has been made of the Canadian Ptiliidae although some of the genera occurring in the Lake Superior region (*e.g.*, *Pteryx* Matthews, *Ptenidium* Erichson, *Ptinellodes* Matthews and *Ptinella* Motschulsky) may also extend to Canada, and *Actidium* Matthews is known from British Columbia as well as California and Texas. The present record, however, appears to be the first of an endemic genus of the Canadian Ptiliidae from the Province of Quebec.

The description of the Ptiliidae given by Arnett (1963: 349) applies to our material except as follows: lacinia apically pointed and slightly curved; middle coxae contiguous; and hind coxae with femoral plates developed throughout. These characters should be incorporated into the definition of the family.

Our material keys out to the genus *Ptinellodes* Matthews, both in Matthews (1884: 114) and Arnett (1963: 350), to which it is certainly most closely allied. However, our genus (*vide infra*) differs from *Ptinellodes* as follows:

Head small, narrower than the elytra; eyes present in both sexes; pronotum without tubercles; lateral borders of the elytra arcuate (FIG. 3); five abdominal segments exposed dorsally; pygidium with three acute teeth, one on apex and two laterally (Figs. 6, 9) **Macdonaldium**, new genus

Head large, wider than the elytra; eyes absent in the male; pronotum with minute tubercles; lateral borders of the elytra nearly straight; four abdominal segments exposed dorsally; pygidium with two acute teeth, one on each side
 **Ptinellodes** Matthews

MACDONALDIUM, new genus

Diagnosis. A combination of the characters mentioned in the key (*vide supra*) should serve to distinguish this genus from others in the Acratrachini.

Shape. Oval.

Head. Transverse, less than twice wider than long, widest across eyes, narrower than pronotum and elytra; clypeo-labral suture prominent, slightly produced anteriorly in middle; gular sutures approximate, not extending to posterior end. Eye entire, round, small, projecting, finely faceted. Antenna nearly twice as long as head; eleven-segmented; filiform but apical three segments slightly swollen, forming a loose club. Labrum large, rounded at apex. Mandible pointed, needle-like at apex. Maxilla with lacinia pointed, slightly curved at apex; maxillary palp four-segmented, segment three largest, segment four narrowest, needle-like. Tentorial bridge (or corpotentorium) with anterior tentorial arm (or pretentorium) M-shaped.

Thorax. Pronotum (Fig. 1) widest at base, nearly half as long as wide; produced above and below at apex and base respectively on each side; procoxae oval, short, contiguous, with trochantins exposed; prosternal apophyses slender, nearly as long as procoxa; sternopleural sutures oblique resulting in large hypomera and narrow prosternite. Middle coxae (Fig. 2) contiguous, their cavities closed by sterna. Metasternum nearly half as long as wide; met-endosternite characteristic, arms long, slender, widely separated, arising from inner angle of hind coxae where fused in a narrow, reduced body, without stalk; metacoxae widely separated, separated by little less than width of coxa, with prominent femoral plates. Scutellum (Fig. 3) sharply tapering at apex, triangular. Wing (Fig. 4) feather-like, with venation extremely reduced, scarcely visible, an upper (? fused Sc + R) with a pterostigma and a lower (? anal vein or its remnant) with characteristic flecks feebly apparent. Elytra truncate, leaving five abdominal segments exposed, without epipleural folds; each with sutural margin straight, lateral margin curved, apex roundly truncate, nearly twice as long as wide. Legs with femora large, in hind legs sparsely spinous; tibiae moderately, sparsely spinous; tarsi slender, apical (*i.e.*, third) tarsal segments much longer than preceding two segments combined.

Abdomen. Six visible sternites; last visible sternite emarginate in male (Fig. 5), entire in female (Fig. 8); pygidium in

both sexes slightly longer than preceding two tergites, with three short teeth, one apical, two lateral (Figs. 6, 9). Aedeagus extremely reduced, hard to distinguish (Fig. 7). Female reproductive system as in Fig. 9, ovipositor not distinct.

Type of the genus: *M. fungi*, new species.

To the memory of Sir William Macdonald, the founder of Macdonald College, this genus of beetles is humbly dedicated.

Macdonaldium fungi, new species (Figs. 1-9)

Holotype. Male (our number 686), CANADA, QUEBEC, East Como, October 16, 1965, from fungus (Dr. & Mrs. M. Abdullah), in the Lyman Entomological Museum at Macdonald College.

Color. Dark brown to fuscous; antennae, palpi, tarsi light brown.

Vestiture. Uniformly, sparsely pubescent.

Punctures. Fine, sparse.

Head. Antenna with first two segments large, first longest, second nearly as long as eleventh; segments three to eight narrow; segments nine to eleven progressively enlarged.

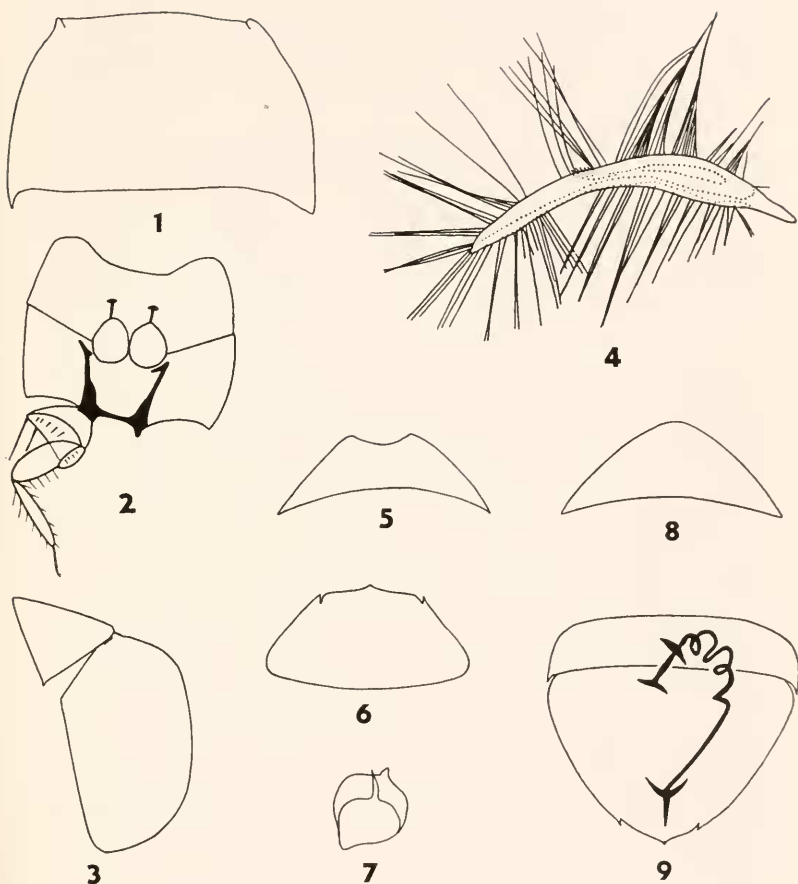
Abdomen. Sixth visible sternite emarginate at apex (Fig. 5).

Total length 1 mm.

Allotype. Female (our number 687), CANADA, QUEBEC, East Como, October 16, 1965, from fungus (Dr. & Mrs. M. Abdullah), in the Lyman Museum. Differs from the holotype in the structure of the sixth visible sternite which is entire at apex (Fig. 8) apart from the reproductive organs (Fig. 9).

The sexes could be easily separated as the last visible abdominal sternite is entire in the female and emarginate in the male.

The immature stages of *Macdonaldium* remain to be discovered but if the association of truncate elytra in the adult with the fan-like fringe of the galea in the larva is a monophyletic character in the Acratrichini, one would expect that the larva of *M. fungi* should possess the fringe. It should be mentioned that similar fringes occur in certain Anistomidae (or



FIGS. 1-7. *Macdonaldium fungi*, new species, holotype, male: 1, pronotum, dorsal view; 2, portion of meso- and metathorax (showing the endosternites and right hind leg) ventral view; 3, scutellum and right elytron, dorsal view; 4, hind wing (long hairs artificially broken and curled or combined at places, actually projecting straight and feather-like); 5, last visible abdominal sternite; 6, pygidium; 7, ninth abdominal segment including the minute aedeagus, hardly visible at 1,600 times magnification.

FIGS. 8-9. *M. fungi*, new species, allotype, female: 8, last visible abdominal sternite; 9, last two abdominal tergites with reproductive organs.

Leiodidae) (*vide* Böving & Craighead, 1931: Pl. 11, Fig. F) and that Crowson's (1955: 36) suggestion of a correlation of these fringes at the apex of the maxillary mala with the habit of feeding on conidia or spores seems plausible. It is difficult to decide whether the truncate elytra (Fig. 3) are a primitive feature of the Ptiliidae (or in fact of the superfamily Staphylinodea) or a derivative one. If the closest affinity of the Ptiliidae is with the Anisotomidae where the elytra are entire, it is conceivable that the truncate elytra and the loss of the fringes are both derivative characters of the Ptiliidae. This hypothesis, however, rests on the supposed derivation of the Ptiliidae from the Anisotomidae or its ancestors for which more evidence is needed.

The met-endosternite (Fig. 2) prompts comparison with the Sphaeriidae (*vide* Crowson, 1955, Fig. 23) and the Histeridae (*vide* Crowson, 1955, Fig. 22) but the details are different and so are many other important characters. We, therefore, do not suggest any direct relationships to these families.

It is fairly certain that the feather-like wings (Fig. 4) of the Ptiliidae are adaptations to extremely minute size and would seem to be useful in dispersal by air in these daytime flyers. (For the periodicity of flight in the Ptiliidae and other insects a reference may be made to an excellent paper by Lewis & Taylor, 1965). Another features in the Coleoptera which seems to be linked with small size is the reduction of the maxillary lobes to one as in the Ptiliidae, Corylophidae, Nitidulidae and many Myxophaga.

REFERENCES

- ARNETT, R. H., JR. 1963. The beetles of the United States. xi + 1112 pp., Washington, D. C.
- BARBER, H. S. 1924. New Ptiliidae related to the smallest known beetle. *Proc. Ent. Soc. Washington* 26: 167-178.
- BÖVING, A. G. and CRAIGHEAD, F. C. 1931. An illustrated synopsis of the principal larval forms of the order *Coleoptera*. *Ent. Amer.* 11: 1-135.
- CROWSON, R. A. 1955. The natural classification of the families of Coleoptera. 187 pp., London.

- LEWIS, T. and TAYLOR, L. R. 1965. Diurnal periodicity of flight by insects. *Trans. R. Ent. Soc. London* 116: 393-479.
- MATTHEWS, A. 1884. Synopsis of North American Trichopterygidae. *Trans. Amer. Ent. Soc.* 11: 113-156.
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Books

INSECT PESTS OF FARM, GARDEN, AND ORCHARD. By **Ralph Howard Davidson** and the late **Leonard Marion Peairs**. Sixth ed. John Wiley & Sons, New York, 1966. Pp. ix, 675, 587 figs. \$17.50.

Only the real old timers will recall the first edition by E. D. Sanderson, 1912, which was so well received that new editions came regularly, with L. M. Peairs as coauthor and later author. The book is now too well known to require discussion except to say that it continues to earn our respect for its concise yet lucid presentation, and that it has been updated as regards control measures, and that for each topic it always gives the latest references, many for 1966.

In 1912, Dr. Sanderson estimated that the insect damage in our country would total about $1\frac{1}{4}$ billions of dollars annually; the present edition estimates 5 billions, plus another for insecticides, plus an unknown amount for labor. Thus the costs of feeding our pests increases even as do other costs—the first edition of this book was listed at \$3.00.—R. G. S.

INSECTS AND HYGIENE. The biology and control of insect pests of medical and domestic importance. By **James R. Busvine**, 2nd ed. Methuen & Co., Ltd., London. Barnes & Noble, Inc., New York, 1966. Pp. xi, 467. \$18.00.

Although written for use in Britain, most of this treatise is equally useful in North America. Its broad approach is immediately evident in the introduction and in the chapters on anatomy, physiology, development, ecology and populations. For each species there is always a wealth of detailed data on life history and bionomics.—R. G. S.